

[00125] WHAT IS CLAIMED IS:

1. A front suspension device for an automotive vehicle, in which wheel support members of right and left front wheels are coupled with each other via a steering unit, an outer end of each of two lower arms is pivotally attached to the wheel support members respectively, and an inner end of each of two lower arms is pivotally attached to a vehicle body via a resilient member respectively, the front suspension device comprising:

a damping device equipped with a coil spring and attached to at least one of said two lower arms at a lower end thereof and to the vehicle body at an upper end thereof, respectively; and

a suppression device for suppressing a toe-change of said front wheels caused by a rotational torque which is applied to said at least one of the two lower arms, to which said damping device is attached, according to extension and contraction of said coil spring of the damping device.

2. The front suspension device for an automotive vehicle of claim 1, wherein said suppression device comprises a rotational torque absorption device for absorbing said rotational torque applied according to extension and contraction of said coil spring of the damping device.

3. The front suspension device for an automotive vehicle of claim 2, wherein said rotational torque absorption device comprises a bearing device provided at an upper end and/or a lower end of said coil spring.

4. The front suspension device for an automotive vehicle of claim 1, wherein said suppression device includes a vehicle body member which constitutes part of the vehicle body to which said damping device is attached at the upper end thereof and is equipped with an elongated hole formed so as to extend in a circumferential direction of the damping device, and an attaching member for attaching said damping device to the vehicle body with an attaching bolt which is adaptive to get through said elongated hole of the vehicle body member, and said damping device is attached to the vehicle body by said attaching

member such that said attaching bolt is fastened in a state where there is provided no or a small amount of rotational torque applied to said at least one of the two lower arms, by applying a load corresponding to a vehicle weight to said coil spring so as to allow the attaching bolt unfastened to move in and along said elongated hole.

5. The front suspension device for an automotive vehicle of claim 1, wherein said suppression device is configured such that said damping device is attached to the vehicle body in a state where a specified twisted-pretension is applied to said coil spring prior to the attachment of the damping device, and there occurs no or a small amount of rotational torque applied to said at least one of the two lower arms according to extension and contraction of said coil spring under at least a straight vehicle driving condition.

6. The front suspension device for an automotive vehicle of claim 1, wherein said suppression device is configured such that said lower arms are arranged so as to be attached to the vehicle body in a specified state where said arrangement functions so as to suppress or offset a displacement of the lower arm caused by the rotational torque which is applied to said at least one of the two lower arms according to extension and contraction of said coil spring.

7. The front suspension device for an automotive vehicle of claim 1, wherein said suppression device is configured such that each of said coil springs for the right and left front wheels has a different winding direction from each other.

8. The front suspension device for an automotive vehicle of claim 7, wherein said winding direction of the coil spring is configured such that the coil spring for the left front wheel has a clockwise direction, while the coil spring for the right front wheel has a counterclockwise direction.

9. The front suspension device for an automotive vehicle of claim 7, wherein said winding direction of the coil spring is configured such that said rotational torque caused according to extension and contraction of said coil spring makes a steered outside wheel under a steering condition change in a displacement in a toe-in direction.

10. The front suspension device for an automotive vehicle of claim 1, wherein said damping device is disposed in a substantially vertical direction of the vehicle.

11. The front suspension device for an automotive vehicle of claim 1, wherein said two lower arms include a front lower arm comprised of a lateral link extending outward from the vehicle body in a substantially width direction of the vehicle and a rear lower arm comprised of a compression link extending forward and outward from the vehicle body in a substantially oblique direction of the vehicle, and a position of a pivotal attachment of said front lower arm to the wheel support member is located forward and inside of that of a pivotal attachment of said rear lower arm to the wheel support member.

12. A method for manufacturing a front suspension device for an automotive vehicle, in which wheel support members of right and left front wheels are coupled with each other via a steering unit, an outer end of each of two lower arms is pivotally attached to the wheel support members respectively, an inner end of each of two lower arms is pivotally attached to a vehicle body via a resilient member respectively, the method comprising:

step of providing a damping device equipped with a coil spring;

step of attaching a lower end of said damping device to at least one of said two lower arms; and

step of attaching an upper end of said damping device to a vehicle body in a state where said coil spring has been contracted to a specified extent and a rotational torque caused by the contracted coil spring has been released, such that there occurs no or a small amount of the rotational torque applied to said at least one of the two lower arms according to extension and contraction of said coil spring under at least a straight vehicle driving condition.

13. A method for manufacturing a front suspension device for an automotive vehicle, in which wheel support members of right and left front wheels are coupled with each other via a steering unit, an outer end of each of two lower arms is pivotally attached

to the wheel support members respectively, an inner end of each of two lower arms is pivotally attached to a vehicle body via a resilient member respectively, the method comprising:

step of providing a damping device equipped with a coil spring;

step of attaching a lower end of said damping device to at least one of said two lower arms; and

step of attaching an upper end of said damping device to a vehicle body in a state where said coil spring has been twisted to a specified extent in a specified direction about the spring axis, such that there occurs no or a small amount of the rotational torque applied to said at least one of the two lower arms according to extension and contraction of said coil spring under at least a straight vehicle driving condition.